REMARKS/ARGUMENTS

Claims 1-24 are currently pending in this application. Claims 7 and 8 have been amended to correct their claim dependency in order to provide sufficient antecedent basis to the phrase "said frequency offset estimation". Claim 19 has been amended to remove a feature that was inadvertently recited twice in the same claim. The Applicants submit that no new matter has been introduced by the amendment herein.

Features of claims 13 and 19 are not fully addressed in the Office Action mailed December 21, 2004

The Examiner has failed to indicate where each of the many components recited in independent claims 13 and 19 are disclosed by the prior art used as a basis to reject these claims. The Examiner apparently had assumed that the limitations of claims 13 and 19 were the same as in claims 1, 2, 4-6, 8-10 and 12. Claims 13 and 19 recite numerous features that are not addressed by the Examiner in the Office Action mailed December 21, 2004.

If the Examiner maintains the rejection of these claims after considering the arguments presented therein, the Applicants respectfully request that the next Office Action prepared by the Examiner be a non-final Action, such that the Applicants have the opportunity to clearly and fully understand the Examiner's position and accordingly prepare a Reply for the Examiner to consider before period of prosecution for the application is closed. The Applicants submit that the pending claims have not been significantly amended in such a way that would require further consideration and search.

Claim Rejections - 35 USC § 103(a)

Claims 1, 2, 4-6, 8-10, 12, 13 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ling et al. (U.S. Patent No. 6,363,102) in view of Admitted Prior Art and Seo et al. (U.S. Patent Application Publication 2002/0163956). Claims 3, 7 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ling et al. in view of Admitted Prior Art and Seo et al. as respectively applied to the claims 1, 2, 5, 6, 9 and 10 above, and further in view of Eilts (U.S. Patent No. 6,393,073). Claims 14-18 and 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ling et al. in view of Admitted Prior Art and Seo et al., as applied to the claims 13 and 19 above, and further in view of Eilts and Bachl et al. (U.S. Patent Application Publication 2002/0191578).

The present invention, as recited in claims 1, 5 and 9, is related to a method, (i.e., claim 1), and apparatus, (i.e., the Rake receiver of claim 5 and the wireless transmit/receive unit (WTRU) of claim 9), used in a wireless radio access or communications system. As shown in Figure 3A of the Applicants' application, a spread modulation signal is received and presented to a plurality of Rake fingers. Each Rake finger processes the spread modulation signal and delays the spread modulation signal by a differing amount of time (see delays 109 in Figures 3A and 3B). The delayed spread modulation signal is multiplied with a first reference signal (see signal 307 in Figure 3B) to produce a control bit signal. The delayed spread modulation signal is multiplied with a second reference signal (see signal 311 in Figure 3B) producing a data signal. The data signal is delayed (see delay 330 in Figure 3B) to produce a delayed data signal. The delayed data signal is multiplied with weights produced by a frequency offset estimator 320 and a complex weight gain generator 325 to produce a first set of data. The outputs of all of the Rake fingers are summed, producing data symbols and control bit symbols (see summers 115 and 117 in Figure 3B).

The Examiner correctly indicates that that Ling et al., (hereinafter referred to as "Ling"), discloses a method and apparatus for frequency offset correction. The Examiner then relies on Ling's Figure 3 as a basis for rejecting specific features recited in claims 1, 5 and 9.

First, the Examiner asserts that a pilot despreader 130 shown in Figure 3 multiplies a spread modulation signal with a first reference signal to produce a control bit signal. The pilot despreader 130 is first mentioned at column 5, lines 34-35 and its function is described by lines 41-57 of column 5 as follows:

> *In this case, pilot despreader 130 may be implemented as an integrate-and-dump circuit. The integration period should be long in order to reduce the sample frequency and thus reduce the computational load, but on the other hand the integration period should be short so that the phase shift due to the frequency offset is negligible within that period. For a frequency offset of 300 Hz and a Doppler component of a few hundred Hertz, an integration period of about 200 μs is used for one embodiment. Before further processing, it may be desirable to truncate the pilot samples by right-shifting, for example. Truncation serves to reduce the data bitwidth in later stages, and a moderate amount of truncation and rounding at this stage has not been shown to introduce any performance degradation. However, truncation is optional.*

Ling does not teach or suggest that the pilot despreader 130 multiplies a spread modulation signal with a first reference signal to produce a control bit signal. Furthermore, each of claims 1, 5 and 9 recite that the spread modulation signal processed by the pilot despreader 130 is delayed by a Rake finger before undergoing the multiplication process. Thus, in accordance with the claimed invention, a spread modulation signal, (that is delayed by a Rake finger), is multiplied with a first reference signal producing a control bit signal. Additionally, Ling does not disclose a reference signal used by the pilot despreader. Ling discloses a pseudonoise (PN) despreader 115 and a data despreader 120 that do use reference

signals I_2 and Q_2, as illustrated in Ling's Figure 5. Nonetheless, the Applicants submit that Ling's data despreader 120 clearly does not perform the same function as the claimed limitation (b) recited in claims 1, 5 and 9.

Second, the Examiner asserts that a data despreader 120 shown in Figure 3 multiplies the same spread modulation signal with a second reference signal to produce a data signal. However, each of claims 1, 5 and 9 recite that the spread modulation signal is delayed by a Rake finger before undergoing the multiplication process. Thus, in accordance with the claimed invention, a spread modulation signal, (that is delayed by a Rake finger), is multiplied with a first reference signal producing a control bit signal. The Applicants submit that Ling's data despreader 120 does not perform the same function as the claimed limitation (c) recited in claims 1, 5 and 9.

Third, the Examiner asserts that the output of a delay 180 shown in Ling's Figure 5 is multiplied with weights produced by a frequency offset estimator and a complex weight gain generator to produce a first set of data. The Examiner asserts that the components that perform this function is a frequency discriminator 140, a loop filtering phase calculator and delay 250, a pilot filter 160, a phase derotator 240, a complex conjugator 170 and a coherent detector 190. The coherent detector 190 multiplies the output of the delay 180 by a channel estimate provided by the complex conjugator 170 (see column 8, lines 23-28). However, Ling does not disclose multiplying the output of the delay 180 with weights produced by a frequency offset estimator and a complex weight gain generator. The Examiner fails to specify which component illustrated in Ling's Figure 3 is a frequency offset estimator that produces weights used by the coherent detector 190, and which component illustrated in Ling's Figure 3 is a complex weight gain generator also used by the coherent detector 190. The Applicants submit that Ling's frequency discriminator 140, loop filtering phase calculator and delay 250, pilot filter 160, phase derotator

240, complex conjugator 170 and coherent detector 190, alone or in combination, clearly do not perform the same function of limitation (e) recited in claims 1, 5 and 9.

The Examiner concedes that Ling does not teach the features recited by limitations (a) and (f) and refers to the teachings of Seo et al. and the Admitted Prior Art. The Applicants submit that Ling, Seo et al. and the Admitted Prior Art, alone or in combination, do not teach or suggest the limitations (b), (c) and (e) recited in claims 1, 5 and 9.

Claims 2-4, 6-8 and 10-12 are dependent upon claims 1, 5 and 9, respectively, which the Applicants believe are allowable over the cited prior art of record for the same reasons provided above.

Claims 13 and 19 each recite a first combiner, a second combiner and a plurality of Rake fingers for receiving and processing a spread modulation signal, whereby each Rake finger comprises the following components:

> *(i) a first despreader having a first input for receiving the spread modulation signal, a second input for receiving a pilot signal and an output for outputting despread pilot symbols;*
>
> *(ii) a second despreader having a first input for receiving the spread modulation signal, a second input for receiving a data signal and an output for outputting despread data symbols;*
>
> *(iii) a data bit processor having an input for receiving the despread pilot symbols and an output for outputting processed pilot symbols to be combined in the first combiner with other similarly processed pilot symbols outputted by other ones of the Rake fingers;*
>
> *(iv) a frequency offset estimator having an input for receiving the despread pilot symbols and an output for outputting a frequency offset estimation signal;*
>
> *(v) a complex weight gain generator in communication with the output of the first despreader and the output of the frequency offset estimator, the complex weight gain generator having a first input for receiving the despread pilot symbols, a*

second input for receiving the frequency offset estimation signal, and an output for outputting weighted symbols;

(vi) a delay element in communication with the output of the second despreader for delaying the despread data symbols, the delay element having an output for outputting the delayed despread data symbols; and

(vii) a multiplier in communication with the output of the delay element and the output of the complex weight gain generator, the multiplier having a first input for receiving the delayed despread data symbols and a second input for receiving the weighted symbols and outputting processed data symbols to be combined in the second combiner with other similarly processed data symbols outputted by other ones of the Rake fingers.

The Examiner has failed to indicate where each of the above components (i) - (vii) of the Rake fingers recited in independent claims 13 and 19 are disclosed by the prior art used to reject claims 13 and 19. The Examiner apparently had assumed that the limitations of claims 13 and 19 were the same as in claims 1, 2, 4-6, 8-10 and 12. Claims 13 and 19 recite numerous features that are not recited in the other claims that the Examiner compared to the prior art of record. Most of the features recited in claims 13 and 19 were not specifically addressed by the Examiner in the Office Action mailed December 21, 2004.

The Applicants submit that Ling, Seo et al. and the Admitted Prior Art, alone or in combination, do not teach or suggest the limitations (a) - (c) recited in claims 13 and 19. Particularly, the prior art of record fails to teach or suggest a plurality of Rake finger, whereby each Rake finger includes the features (c)(i) - (c)(vii) recited in claims 13 and 19, as outlined above.

Claims 14-18 and 20-24 are dependent upon claims 13 and 19, respectively, which the Applicants believe are allowable over the cited prior art of record for the same reasons provided above.

Based on the arguments presented above, the withdrawal of the rejection of claims 1-24 under 35 U.S.C. 103(a) is respectfully requested.

Conclusion

If the Examiner believes that any additional minor formal matters need to be addressed in order to place this application in condition for allowance, or that a telephone interview will help to materially advance the prosecution of this application, the Examiner is invited to contact the undersigned by telephone at the Examiner's convenience.

In view of the foregoing amendment and remarks, the Applicants respectfully submit that the present application, including claims 1-24, is in condition for allowance and a notice to that effect is respectfully requested.

Respectfully submitted,

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